NICOR GAS COMPANY'S
COMMENTS ADDRESSING ENERGY STORAGE

In accordance with the schedule set by the Illinois Commerce Commission ("Commission") Staff ("Staff"), Northern Illinois Gas Company d/b/a Nicor Gas Company ("Nicor Gas" or the "Company") submits these Comments in the Energy Storage Workshop, which was initiated pursuant to Section 16-135 of the Public Utilities Act (the "Act"). 220 ILCS 5/16-135.

I. INTRODUCTION

Nicor Gas appreciates the work that Staff has undertaken so far to initiate the discussion of the future of energy storage in Illinois and welcomes the opportunity to submit these comments. The issues before the Commission in this workshop likely will affect the long-term health and welfare of Illinois citizens, the viability of businesses and overall economic growth of the state, as well as our environment. In the context of evaluating the costs and benefits of energy storage, Nicor Gas believes that its decades-long experience and insight serving customers utilizing substantial energy storage assets will be of value to the Commission and this workshop process as it develops a framework to understand the costs, benefits, barriers and, ultimately, the potential of energy storage in the future.

As a matter of background, Nicor Gas employs approximately 2,100 full time equivalent ("FTE") employees (including 1,350 members of IBEW Local 19) to deliver clean, safe and reliable natural gas to more than 2.2 million homes and businesses in over 650 northern Illinois communities. Nicor Gas is committed to improving the environment by:

- empowering customers to reduce their carbon footprint with comprehensive energy efficiency ("EE") program that, since 2011, has more than 845,000 participating customers who have saved more than 168 million therms and avoided more than

893,000 metric tons of CO2 emissions which is the equivalent of 193,000 passenger vehicles annually;

- making commitments to renewable energy and is pursuing a diverse energy resource portfolio that includes resources like renewable natural gas ("RNG") that are low-carbon and even under certain circumstances carbon-negative; and
- setting a goal for its operations to have net zero methane emissions by 2030.

Nicor Gas' system consists of approximately 34,000 miles of transmission and distribution main and eight natural gas storage fields with a working natural gas capacity of 135 billion cubic feet ("Bcf"). Properly maintained, these storage fields can continue to provide Nicor Gas with many decades of operational capabilities to heat the homes and businesses of millions of customers in Northern Illinois. Through its storage assets and other facilities, the Company serves three gas-fired electric peaking plants, as well as other commercial and industrial customers who operate co-generation facilities and/or provide back-up electric generation. Subject to meeting eligibility requirements, these electric power generating customers can be served through Rate 19 or Rate 77. This on-system storage capacity has served Nicor Gas and its customers for more than six decades, and the Company's experience in operating such assets should provide important insight that would be helpful for the Commission as it meets the legislative goal of this proceeding to "examine specific programs, mechanisms, and policies that could support the deployment of energy storage systems."

Nicor Gas' comments address four relevant areas that affect the framework that the Commission is charged with developing in this proceeding. To summarize, it is Nicor Gas' position that in order to develop a recommendation to the General assembly, through this workshop process the Commission should:

- develop the facts determining the State's total current energy needs, both annually and during peak days during the winter and summer seasons, as well as anticipated future requirements;
- ascertain the purpose of additional energy storage assets, and develop an understanding as to the types of additional energy storage technologies to be considered and their useful life, and the expected short-term and long-term cost of employing such technology to meet the proposed use;
- reach conclusions that are technologically neutral and consistent with the definition of energy storage in Section 16-135(b) of the Act; and
- consider other relevant factors to the state's energy storage policy including costs to achieve the goals and affordability (especially for lower income households), the effect on existing Illinois businesses and jobs in this state, and the effect of these policies on the continuous provision of energy and the related impacts to the safety, health, and welfare of Illinois citizens.

II. THE STATE'S TOTAL ANNUAL AND PEAK DAY ENERGY NEEDS SHOULD SERVE AS A FOUNDATION FOR EVALUATING THE COSTS AND BENEFITS ASSOCIATED WITH ENERGY STORAGE

Section 16-135(c) of the Act calls for a Commission "…proceeding to examine specific programs, mechanisms, and policies that could support the deployment of energy storage systems." 220 ILCS 5/16-135(c). The Commission's notice for these workshops tracks language in that the statute that requires the proceeding to, "at minimum…develop a framework to identify and measure the potential costs, benefits, that deployment of energy storage could produce, as well as barriers to realizing such benefits…." 220 ILCS 5/16-135(c)(1). The statute and attendant notice continue on to list potential benefits attendant to storage including, among

other things, avoided costs, lower peak power costs and reduced capacity costs, reduced costs for emergency power supplies during outages, reduced curtailment of renewable energy generators, reduced greenhouse gas emissions, increased resource diversification, and increased economic development.

To engage in the cost/benefit analysis described above, the Commission's analysis should be based on the State's energy requirements, both on an annual basis, as well as during summer and winter peak periods. It is important that the Commission not only focus on how much energy storage would be required to maintain operation of the electric grid – but also on the energy needed to maintain an uninterrupted, reliable, resilient, and affordable flow of energy to customers – regardless of whether the energy is electricity or gas. To be clear, Nicor Gas is not taking a position on the feasibility or benefits of energy storage – but rather these comments are focused on providing context for the role that energy storage will play in the future. Thus, Nicor Gas presents the following relevant facts for the workshop and future discussions.

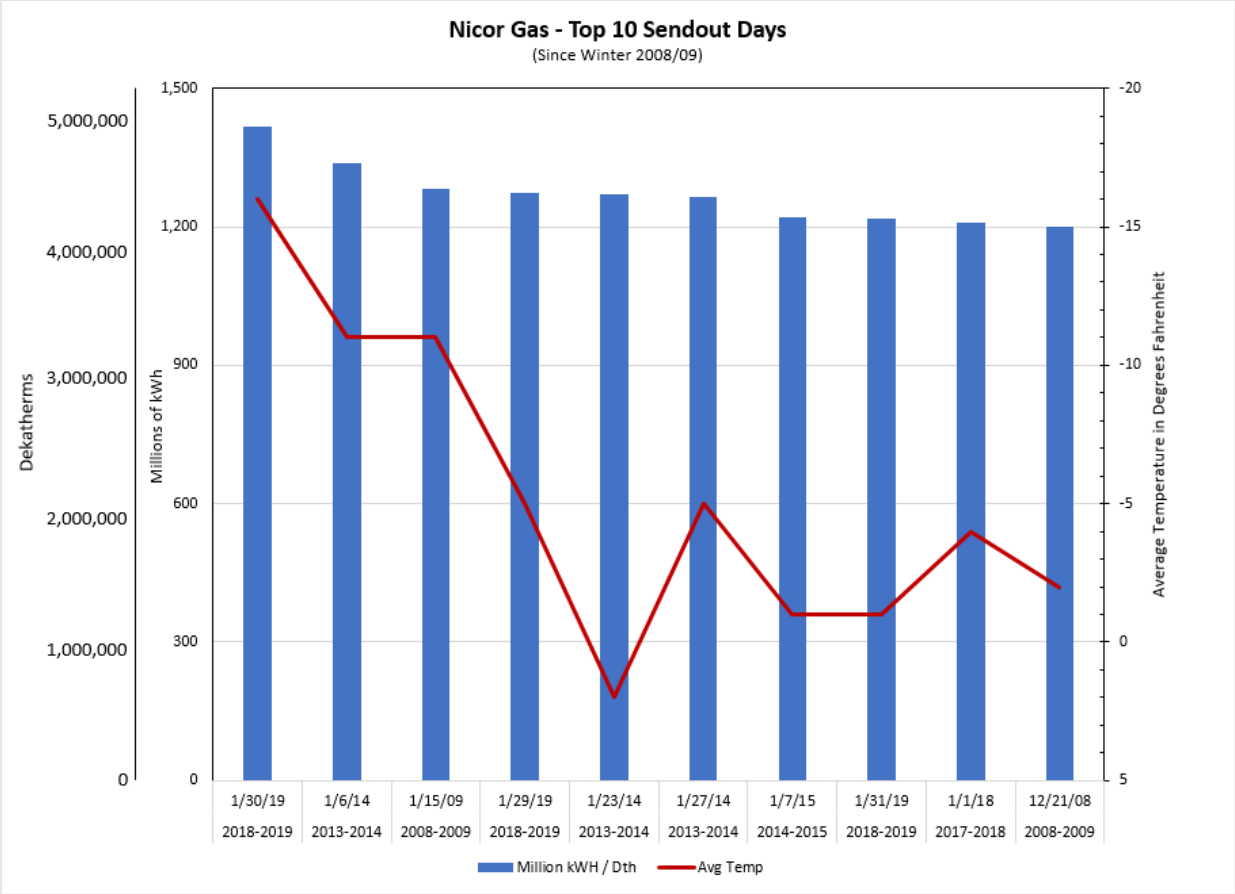
First, as is the case with all utilities, Nicor Gas plans system capacity and energy delivery around peak throughput days utilizing a combination of gas in its on-system storage assets and flowing gas acquired from a diverse selection of production areas and transported to Illinois by pipeline companies. For gas utilities, peak days typically occur on the coldest days of the year. Indeed, over the last decade, northern Illinois has experienced a number of severe weather events resulting in an enormous amount of energy delivered to Northern Illinois customers.

For example, during the January 2019 polar vortex when, for two days, the Company's service territory experienced temperature highs of -18 degrees Fahrenheit and lows of -32 degrees Fahrenheit. During that period, Nicor Gas delivered 8.9 Bcf of natural gas over two days, with a one-day record of 4.8 Bcf on January 30, 2019 (meanwhile, January 29th was Nicor

Gas' fourth highest sendout day on record). Approximately 35% of the gas from that 8.9 Bcf two-day sendout was delivered from the Company's on-system storage assets, which is the equivalent of 912 million kWh of energy. Meanwhile, all Nicor Gas customers were reliably served with no curtailments of natural gas service. Recognizing that January 30th demand was a record peak in the Nicor Gas service territory, a key consideration for the Commission is that delivery of 4.8 Bcf on January 30, 2019 translates to approximately 60.8 gigawatts ("GW") of electricity[1] which is more than double the historic peak demand of approximately 23.8 GW that Commonwealth Edison Company ("ComEd") experienced on July 20, 2011.[2] Moreover, the demand for gas over this two-day period is greater if one includes the peak demands of the Peoples Gas Light and Coke Company and North Shore Gas Company. And, of course, these figures do not include the amount of electricity ComEd delivered to its customers during this same period. The following table illustrates how much energy Nicor Gas delivered on its top ten peak days measured in Dekatherms and millions of kWh.

[1] Calculated as sustained energy delivery capacity (averaged over 24 hours). The peak hour would likely be somewhat higher. Following is the calculation: 4.88*10^9 scf/24 hours* 1,020 Btu/scf * 1 kWh/3,412 Btu = 60, 785, 463 kW (or 60.8 GW or 60,785 MW).

[2] *See* ComEd Outlook: Next Generation Grid Component R&D Program Planning Workshop, August 2016 https://www.energy.gov/sites/prod/files/2017/09/f36/%5B4%5D%20ComEd%20Presentation%20-%20Dale%20Player.pdf



This table demonstrates that: 1) the magnitude of energy needed to maintain uninterrupted energy to homes and businesses during these peak delivery days is much larger than seen for summer electricity cooling loads; and 2) the majority of these peaks occurred over the last decade.

Second, while evaluating the peak energy needs in the State is an important factor when considering the purpose of additional energy storage, the Commission also must not lose sight of the duration of such events. For example, during the weather events of February 2015 (tied for the coldest February on record[3]), the average monthly temperature that month was just 14.6

[3] *See* Williams-Harris, Deanese, "Chicago ties 140-year-old record for coldest February", March 1, 2015, https://www.chicagotribune.com/news/breaking/chi-weekend-forecast-record-low-temps-and-snow-20150228-story.html

degrees Fahrenheit and the area experienced 26 inches of snow. Nicor Gas operates its storage assets in a manner to respond to such events so that the Company can utilize gas from its storage fields and flowing gas to maintain an uninterrupted flow of energy that reliably keeps millions of customers warm. The point is that energy storage is not a static figure and multiples of the daily figure may be needed to calculate the ultimate storage capacity required.

Third, maintaining continuous delivery of energy is a matter of public safety. When examining energy use from a total energy perspective, for Nicor Gas peaks occur during the coldest times when interruptions in energy flow can affect the health and safety of millions of people. Attendant to this consideration is that the Company must design energy delivery systems, including storage assets, with adequate reserve margins to ensure that energy flow will not be interrupted. Thus, as significant as the amount of energy that Nicor Gas delivers during those extreme weather events – the system operated without a major fault and is designed to handle even worse weather conditions.

Thus, Nicor Gas' energy storage experience is relevant to capacity planning discussions. The high energy delivery numbers are possible due to the capabilities of its on-system storage assets. It also is notable that, aside from ensuring the uninterrupted delivery of energy, Nicor Gas' storage facilities also help manage pipeline transportation costs. By using deliverability from storage withdrawals for the heating season, Nicor Gas avoids hundreds of millions of dollars per year in costs associated with holding pipeline transportation capacity year-round, which benefits customers.

III. WHAT WILL BE THE PURPOSE OF ADDITIONAL ENERGY STORAGE?

Given Nicor Gas' many decades of experience utilizing energy storage assets, and in light of the information above, it is the Company's belief that a fundamental question the Commission must consider is what will be the purpose of additional energy storage? For example, will such

storage serve as a backup to meet existing electric demand on an intermittent basis, or will such storage be utilized for extended periods of time, or something else? In the event the contemplated additional energy storage is envisioned to displace current gas demand, such an exercise must consider the degree of incremental resources needed above those needed to serve existing electric demand as well as any other incremental increases in electric demand, particularly tied to increased electrification of transportation and overall increases in energy needs tied to economic development. In short, while an evaluation of the potential benefits of additional energy storage is part of the process, the Commission must first understand the purpose underlying the use of additional energy storage. The envisioned purpose of such energy storage assets will affect the type of storage required and how much storage is needed, which also will have a direct impact on the cost of this storage for customers. Understanding the potential cost of such an undertaking is critical for the Commission to conduct a meaningful cost/benefit analysis.

IV. WORKSHOPS SHOULD BE TECHNOLOGY-NEUTRAL AND ENABLE FUTURE PATHWAYS FOR LOW CARBON AND RENEWABLE FUELS

Section 16-135(b) of the Act defines "energy storage system" as:

> "…a technology that is capable of absorbing zero-carbon energy, storing it for a period of time, and redelivering that energy after it has been stored in order to provide direct or indirect benefits to the broader electricity system. The term includes, but is not limited to, electrochemical, thermal, and electromechanical technologies."

This statutory definition assumes that stored energy would benefit (directly or indirectly) the "broader electricity system." This definition is intentionally broad to leave open different and evolving methods of storing energy. Without addressing what the legislature meant by

"indirect" benefit to the electricity system, it nonetheless is clear that this definition goes beyond traditional battery storage.

Given that technology is not static, it makes sense for the Commission to maintain a broad – and technologically neutral – view of storage and interpretation of this language. Nicor Gas can speak to three technologies under development in the gas utility industry that could help Illinois ultimately meet its energy storage goals:

- **Hydrogen:** Hydrogen produces no carbon dioxide when it burns – just water vapor – with tremendous potential to reduce end-use emissions by using hydrogen as a fuel. The gas utility industry, in partnership with other participants in the energy industry and other stakeholders in the public and private sector, is exploring ways that the natural gas system can be utilized to transport this resource.
- **Power to Gas:** While there are a range of production methods for low carbon hydrogen, one area of particular interest is "green" hydrogen, which is created through the use of renewable resources like wind and solar. The gas utility industry is exploring the potential to combine green hydrogen with CO_2 (from non-fossil sources) to produce methane, as an option for storing energy from renewables with hydrogen-based renewable gas, potentially transporting energy from renewables over long distances – from regions with abundant resources, to energy-hungry areas.
- **RNG:** This is a sustainable and alternative source of natural gas created by capturing and utilizing fugitive methane (which has 25 times global warming potential of CO_2) from sources like landfills and agricultural waste, food

processing waste, municipal waste and water treatment facilities, and is considered carbon neutral at the point of use.

Renewable and other sustainable fuels can play a role in the Illinois energy storage program – particularly in meeting seasonal peak energy needs. It makes sense for stakeholders and the Commission to maintain flexibility as to how goals can be met in the long run as different technologies mature. The Commission should be mindful that the existing gas system can be leveraged to play a role in the state's renewable energy future.

V. ADDITIONAL CONSIDERATIONS FOR THIS WORKSHOP

The Commission should also be mindful of other factors that affect future energy policy and the proliferation of energy storage, including additional costs to customers (especially lower income households) and the effect that such policies would have on Illinois businesses.

VI. CONCLUSION

Nicor Gas appreciated the opportunity to make these comments. In sum, Nicor Gas respectfully proposes that in order to properly assess the costs and benefits of additional energy storage when developing an appropriate future approach to energy storage, in this workshop process the Commission should:

- develop an understanding of Illinois' total annual energy needs, as well as peak day energy needs, and refrain from making decisions that undermine the ability of utilities to provide uninterrupted, safe, reliable energy to customers when it is most needed;
- develop an understanding of the purpose of additional energy storage being considered and potentially utilized in order to properly evaluate the costs associated with such a proposal;

- ensure that these workshops be technologically neutral and open to all potential technological solutions.

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Respectfully submitted,

NORTHERN ILLINOIS GAS COMPANY

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